

CLAIMS

1. A method for storing data on a storage media, the method comprising:  
writing the data to the storage media in a density sufficiently high to cause  
spontaneous degradation of the data over time;
- 5 automatically reading the data prior to occurrence of a hard error; and  
writing the data a second time.
2. The method of Claim 1 further comprising:  
10 checking if a refresh indicator satisfies a predetermined condition related to  
degradation of the data over time; and  
performing said “writing the data a second time” only if said predetermined  
condition is satisfied.
3. The method of Claim 1 further comprising:  
15 writing the refresh indicator to a location in the storage media distinct from  
another location used to write the data.
4. The method of Claim 3 further comprising:  
20 using a date of performance of said “writing the data to the storage media” to  
determine the refresh indicator.
5. The method of Claim 4 wherein:  
said using includes setting the refresh indicator to be said date; and  
25 said predetermined condition is satisfied when said refresh indicator is older  
than a current date by a predetermined time period.
6. The method of Claim 4 wherein:  
said determining includes setting the refresh indicator to be a refresh date  
obtained by adding a predetermined time period to said date; and  
30 said predetermined condition is satisfied when said refresh date is older than a  
current date.
7. The method of Claim 2 further comprising:  
35 determining, subsequent to said writing, a difference between a first value of  
the refresh indicator determined contemporaneous with said writing and a second  
value of the refresh indicator determined at a current time;  
wherein said predetermined condition is satisfied when said difference is  
greater than a predetermined limit.

8. The method of Claim 2 further comprising:  
using an amplitude of a readback signal of the data as the refresh indicator.

5 9. The method of Claim 8 wherein said amplitude is hereinafter "first  
amplitude," and the method further comprises:

writing the first amplitude to a location in the storage media distinct from  
another location used to write the data;

10 measuring a second amplitude of the readback signal contemporaneous with  
said checking; and

said checking includes determining a difference between the second amplitude  
and the first amplitude.

15 10. The method of Claim 9 wherein:

said checking further comprises comparing said difference with a  
predetermined limit.

20 11. The method of Claim 10 wherein:

said checking further comprises comparing a percentage value of said  
difference with a predetermined percentage.

12. The method of Claim 2 wherein:

the checking is performed periodically without scanning the entire storage  
media.

25 13. The method of Claim 2 wherein:

the refresh indicator is saved contemporaneous with said writing.

14. The method of Claim 1 wherein:

30 said "automatically reading the data" and said "writing the data a second time"  
are both performed prior to occurrence of a soft error.

15. The method of Claim 1 wherein:

35 said "automatically reading the data" and said "writing the data a second time"  
are both performed on a schedule for all the data.

16. The method of Claim 15 wherein:

said schedule is periodic.

17. A storage medium carrying:  
data written in a density sufficiently high to cause spontaneous degradation  
over time; and  
a refresh indicator that indicates a predetermined degradation of the data.

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18. The storage medium of Claim 17 wherein:  
the data is held in a file; and  
the refresh indicator is stored as an attribute of the file.
- 10 19. The storage medium of Claim 18 wherein:  
the attribute is stored in a directory entry of a file system.

20. The storage medium of Claim 17 wherein:  
the refresh indicator is based on a time when the data was most recently  
15 written.

21. The storage medium of Claim 17 wherein:  
the refresh indicator is based on an amplitude of a readback signal of the data  
at the time of writing the data.
- 20 22. The storage medium of Claim 17 wherein:  
the data is held as polarity of magnetized portion of the storage medium.
- 25 23. A carrier signal embedded with:  
data; and  
a refresh indicator that indicates a predetermined degradation of the data.

24. The carrier signal of Claim 23 wherein:  
the refresh indicator is based on a time when the data was most recently  
30 written.

25. The carrier signal of Claim 23 wherein:  
the refresh indicator is based on an amplitude of a readback signal of the data  
at the time of writing the data.
- 35 26. An apparatus including:  
a storage medium embedded with data at a density sufficiently high to  
spontaneously undergo thermal degradation with passage of time; and

an electronic device coupled to the storage medium to perform a refresh operation on the data when the data satisfies a predetermined condition related to the thermal degradation.

- 5        27.     The apparatus of Claim 26, wherein:  
            the predetermined condition is based on a time when the data was most recently written.
- 10        28.     The apparatus of Claim 26, wherein:  
            the predetermined condition is based on an amplitude of a readback signal of the data at the time of writing the data.
- 15        29.     A storage medium embedded with computer instructions for:  
            writing data to a magnetic medium; and  
            automatically reading the data and writing the data back to the magnetic medium without scanning the magnetic medium.
- 20        30.     The storage medium of Claim 30 wherein:  
            during each writing the data is recorded at a density sufficiently high to spontaneously undergo thermal degradation with passage of time; and  
            the computer instructions include checking if a refresh indicator satisfies a predetermined condition related to degradation of the data over time.
- 25        31.     A carrier signal embedded with computer instructions for:  
            writing data to a magnetic medium; and  
            automatically reading the data and writing the data back to the magnetic medium without scanning the magnetic medium.
- 30        32.     The carrier signal of Claim 31 wherein:  
            during each writing the data is recorded at a density sufficiently high to spontaneously undergo thermal degradation with passage of time; and  
            the computer instructions include checking if a refresh indicator satisfies a predetermined condition related to degradation of the data over time.